

REMARKS

None of the claims have been amended or cancelled. Claims 1, 2, 4, 5, 7 and 11-13 are pending and claim 13 has been withdrawn from consideration. Claims 1, 11, 12 and 13 are the independent claims. No new matter is presented in this Amendment.

REJECTIONS UNDER 35 U.S.C. §102:

Claims 1-2, 5, 7 and 11-12 are rejected under 35 U.S.C. §102(b) as being anticipated by Mitnaga et al. (U.S. Patent 5,923,997).

Regarding the rejection of independent claim 1, it is noted that claim 1 recites a display device with a polysilicon substrate, comprising amongst other novel features a display region; a driving region; a first plurality of thin film transistors, each transistor including a source, gate and drain region, and located in the display region; a second plurality of thin film transistors, each transistor including a source, gate and drain region, and located in the driving region; wherein the primary crystal grain boundaries are located within the gate regions of the first plurality of thin film transistors and are inclined to a first direction of current flowing from source to drain of each of the first plurality of thin film transistors in the display region at an angle of -30° to 30° and the secondary crystal grain boundaries are located within the gate regions of the first plurality of thin film transistors and are inclined to a second direction of current flowing from source to drain of each of the first plurality of thin film transistors in the display region.

The Examiner indicates that Mitnaga discloses a display region and a peripheral driving circuit region, and that **a crystallization process occurs in a perpendicular direction in the display region, and the crystallization process occurs in a horizontal direction in the peripheral driving circuit region.**

Applicants respectfully traverse such assertions for at least the following reasons.

First, Mitnaga discloses a crystallization method in which "In of a group III element, Sb of a group V element and Sn of a group IV element are added by a small amount to crystallize a silicon film" (column 9, lines 52-57). Mitnaga further discloses "a thin film of In having a thickness of 5 to 200Å is selectively formed" (column 10, lines 17-19). Finally, the reference discloses that "The crystal growth is made in the form of a needle or a column" (column 10, lines

44-45). Therefore, the crystallization method taught by Mitnaga is known as a "metal induced lateral crystallization (MILC)" method.

Further, Mitnaga discloses that "when the TFT is operated, the carriers move along the crystal which grew in the form of a needle or a column between the source and the drain. That is, the carriers move along the outline of the crystal grain boundaries of the crystals in the form of a needle or column" (column 12, lines 57-64 and related FIG. 2),

Therefore, from the first embodiment of Mitnaga, and from the disclosures noted above, it can be determined that **the crystal growth direction is horizontal to the crystal grain boundaries**. In other words, the crystal grain boundaries disclosed in Mitnaga **are horizontal to the crystal growth direction**. Furthermore, it is noted that the above-mentioned configuration relates to a **TFT of the peripheral driving circuit region**.

The TFT of a pixel region of Mitnaga is disclosed in lines 31-46 of column 15 as follows: "the direction of the source and drain regions are so designed in such as manner that the current crosses grain boundaries formed within the channel region of the TFT (lines 37-40)." Further, "unlike previous embodiments, it is so designed that the direction in which the crystallization proceeds is perpendicular to the current flow direction in the TFT." Thus, it can be seen that the crystal growth direction is identical to the direction in which the crystal grains are formed.

Accordingly, it can be seen that **the crystal grain boundaries of Mitnaga refer to those crystal grain boundaries horizontal to the crystal growth direction**.

Meanwhile, in independent claim 1 **the "primary crystal grain boundaries" refer to those crystal grain boundaries perpendicular to the crystal growth direction**.

Further, as mentioned above, the "primary crystal grain boundaries" recited in independent claim 1, refer to only the crystal grain boundaries formed by the SLS crystallization method, whereas Mitnaga relates to the MILC method which uses a metal catalyst for the crystallization. Thus, the crystal grains based on the SLS crystallization method are completely different from those based on the MILC.

Accordingly, Applicants respectfully assert that the rejection of independent claim 1 under 35 U.S.C. §102(b) should be withdrawn because Mitnaga fails to teach or suggest each feature of independent claim 1.

Regarding the rejection of independent claims 11 and 12, it is noted that these claims recite some substantially similar features as claim 1. Thus, the rejections of these claims are also traversed for substantially the same reasons set forth above.

Furthermore, Applicants respectfully assert that the rejection of dependent claims 2, 5 and 7 under 35 U.S.C. §102(b) should be withdrawn at least because of their dependency from independent claim 1, and the reasons set forth above, and because the dependent claims include additional features which are not taught or suggested by the prior art.

Therefore, it is respectfully submitted that claims 2, 5 and 7 also distinguish over the prior art.

REJECTIONS UNDER 35 U.S.C. §103:

Claim 4 is rejected under 35 U.S.C. §103(a) as being unpatentable over Mitnaga et al. (U.S. Patent 5,923,997).

Regarding the rejection of claim 4, it is noted that claim 4 depends from independent claim 1, and as noted above, Mitnaga fails to teach or suggest the novel features of independent claim 1.

Accordingly, Applicants respectfully assert that the rejection of dependent claim 4 under 35 U.S.C. §103(a) should be withdrawn at least because of its dependency from claim 1, and because the dependent claim includes additional features which are not taught or suggested by the prior art. Therefore, it is respectfully submitted that claim 4 also distinguishes over the prior art.

CONCLUSION:

There being no further outstanding objections or rejections, it is submitted that the application is in condition for allowance. An early action to that effect is courteously solicited.

Finally, if there are any formal matters remaining after this response, the Examiner is requested to telephone the undersigned to attend to these matters.

If there are any additional fees associated with filing of this Amendment, please charge the same to our Deposit Account No. 503333.

Respectfully submitted,

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